

# Energy Savings Performance Contracting

## Water and Wastewater Treatment Plant Energy Efficiency Workshop July 20-21, 2011

*Presented By:*



Energy Services Coalition  
Kentucky Chapter



Kentucky Department for Energy  
Development & Independence

*Sponsors:*



Kentucky Council of Area  
Development Districts



Kentucky Pollution  
Prevention Center

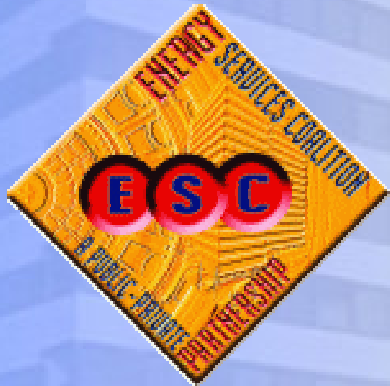
KPPC  
Kentucky's Resource Center for  
Environmental Sustainability



Kentucky Division  
of Water



Kentucky Rural  
Water Association



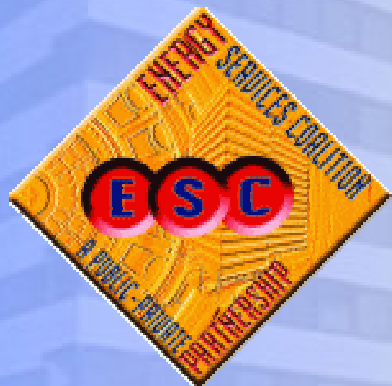
# Energy Services Coalition

- **The Energy Services Coalition (ESC) is a national nonprofit organization composed of a network of experts from a wide range of organizations working together at the state and local level to increase energy efficiency and building upgrades through energy savings performance contracting.**
- **More info may be found at [www.energyservicescoalition.org](http://www.energyservicescoalition.org)**



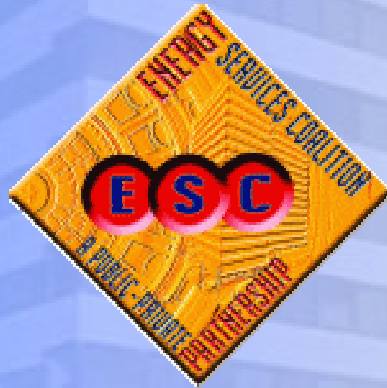
# Agenda

- **What is Energy Savings Performance Contracting?**
- **How Does It Work?**
- **Is My Facility a Candidate?**
- **Common Terminology**
- **Advantages of ESPC**
- **Applicable Legislation**



# Agenda

- **Sample Cash Flow and Self-Funding Program**
- **Guarantee Basics**
- **Measurement and Verification Basics**
- **Financing and Funding Options**
- **How To Get Started**
- **Questions and Answers**



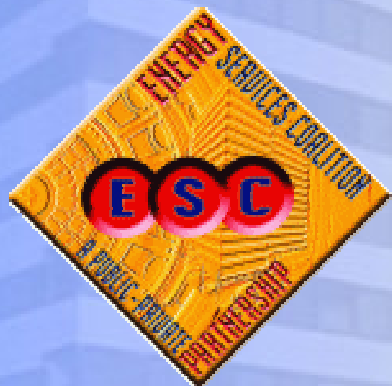
# Energy Savings Performance Contracting (ESPC) Defined

“The use of guaranteed savings from the maintenance and operations budget (utilities) as capital to make needed upgrades and modernizations to your building environmental systems, financed over a specified period of time.”



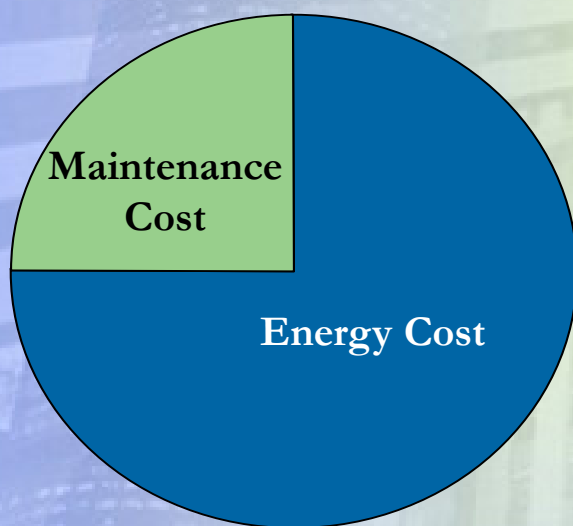
-United States Department of Energy



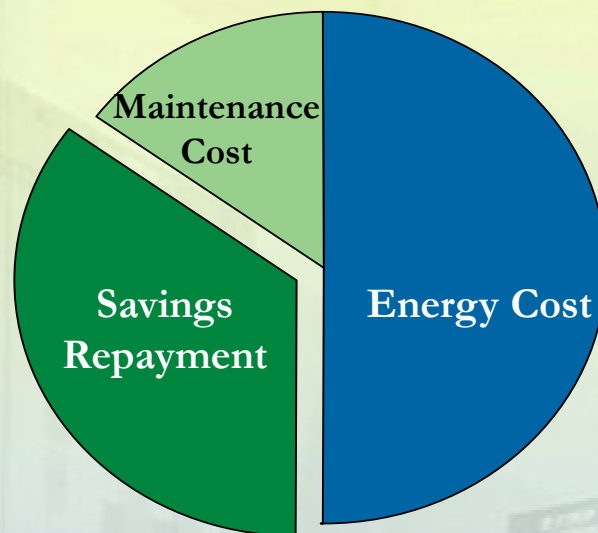


# How Does Performance Contracting Work?

**The ESCO guarantees that cost avoidance (utility & operations expenses) will meet or exceed annual payments to cover all project costs over an agreed debt service period, or the ESCO pays the difference.**



Pre Project



Post Project



# Typical WWTP Energy Conservation Measures

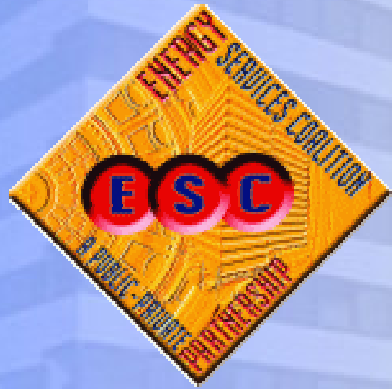
- **Utility Rate Structure Analysis**
- **TOU Load Shifting Strategies**
- **Power Factor Correction**
- **Lighting Retrofit / Replacement**
- **HVAC Upgrades**
- **High Efficiency Pumps & Motors**
- **Variable Frequency Drives**
- **Odor Control System Upgrades**
- **Pump System Optimization**
- **Dewatering System Upgrades**
- **High Efficiency Blowers**
- **Course to Fine Bubble Diffusers**
- **Advanced Dissolved Oxygen Control**



# Typical WWTP Energy Conservation Measures

- **Bio-Nutrient Removal**
- **Methane Capture and Reuse**
- **Power Factor Correction**
- **Fats, Oils, and Grease Addition to Anaerobic Digester for Methane Production**
- **Disinfection System Upgrades**
- **SCADA System Upgrades**
- **Clarifier Weir Cleaners**





# Turnkey Approach

- **Identify and Evaluate Cost Avoidance Opportunities**
- **Develop Engineering Designs and Specifications with the assistance of the consulting engineer**
- **Facilitate Financing**
- **Manage the Project from Design to Installation to Monitoring**
- **Provide Training**
- **Guarantee Savings Will Cover All Project Costs**



## How Does an ESCO Get Paid?

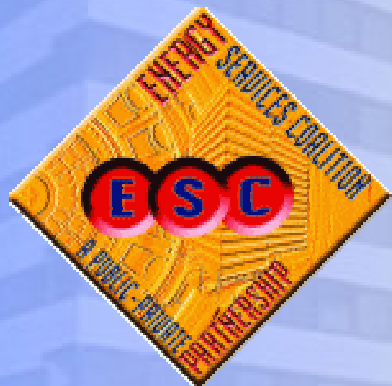
- **Industry Accepted Percentages for Engineering, Project Management, Commissioning, and Closeout**
- **Comparable to any General Contractor or Design Build Contractor**
- **Firm Fixed Price - No Change Orders for a Given Scope**
- **Development Costs are Rolled into Construction Cost**
- **ESCOs are Paid Based upon a Schedule of Values and Approved Progress Billings**
- **Not a Shared Savings Approach – Owner Keeps Excess Savings**



# Is My Facility a Candidate for ESPC?

## **Do I Have:**

- **Deferred Maintenance Issues & Aging Equipment**
- **Too Many Demands on Maintenance Staff**
- **Lack of Funds for Facility Improvements**
- **Budget Constraints and High Utility Costs**
- **No Recent Upgrades**
- **Little Experience with Energy Efficiency**



# Common Terminology

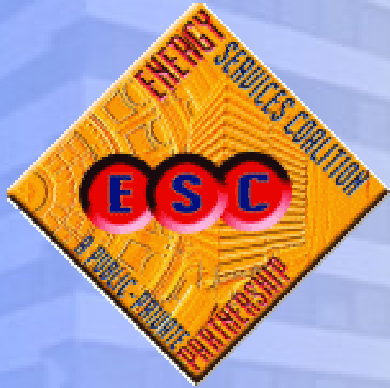
- **ESPC, EPC, or PC – Energy Savings Performance Contracting**
- **ESCO – Energy Services Company**
- **ECM - Energy Conservation Measure**
- **FIM – Facility Improvement Measure**
- **Performance Contract – An agreement between a Municipality/WWT-WT Facility and an Energy Services Company (ESCO)**
- **Financing – Tax exempt financing instrument**



# Common Terminology

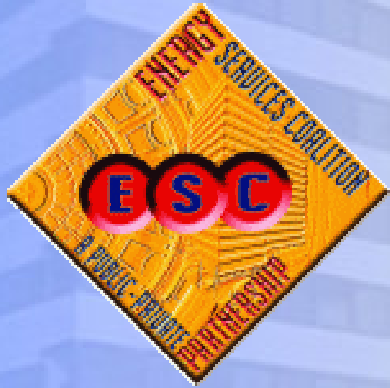
- **Energy Savings – Reductions in energy or utility consumption**
- **Operational Savings – Reductions in operating expenses**
- **Guarantee – Written guarantee that energy savings, operational savings, and capital cost avoidance will meet or exceed the costs of the ECMs within the term of the contract.**
- **M&V – Measurement and Verification**





# Advantages of ESPC

- **Proven results, technology, & expertise**
  - Reliable way to make energy saving improvements and needed infrastructure upgrades
  - Design and specification done by your consulting engineer
- **Savings and performance are guaranteed by ESCO**
- **Minimize capital costs**
  - Money already allocated for utilities is used for improvements
- **Fixed price contract; no change orders**



# Applicable Legislation

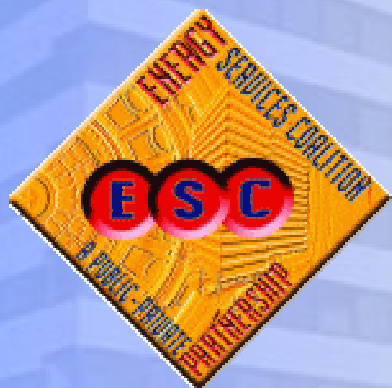
- **KRS 45A.370, 45A.375, 45A.380, or 45A.385**
- **Authorizes the use of guaranteed energy savings performance contracts by units of local government.**
- **Requires an RFP process for competitive bidding and shall not be subject to an award determination based solely on the lowest competitive bid or a separate bidding process for each energy conservation measure (ECM) listed in the proposal.**
- **Exempts ESPC from current and future debt limitations**



# Sample Cash Flow: Self-Funding Program

- **City of Clearwater Northeast Plant:**
  - 13.5 MGD Plant operating at 50% capacity
  - Pays \$1,154,162 in annual utility/other costs
  - Wants cost recovery between 12 and 15 years
  - Need self-funding program (savings pays for upgrades)

Utility / Other	Total Cost
Electric	\$837,922
Natural Gas	\$8,476
Odor Control Chemicals	\$11,553
Polymer	\$67,058
Disposal - Land Application	\$229,153
Total	\$1,154,162

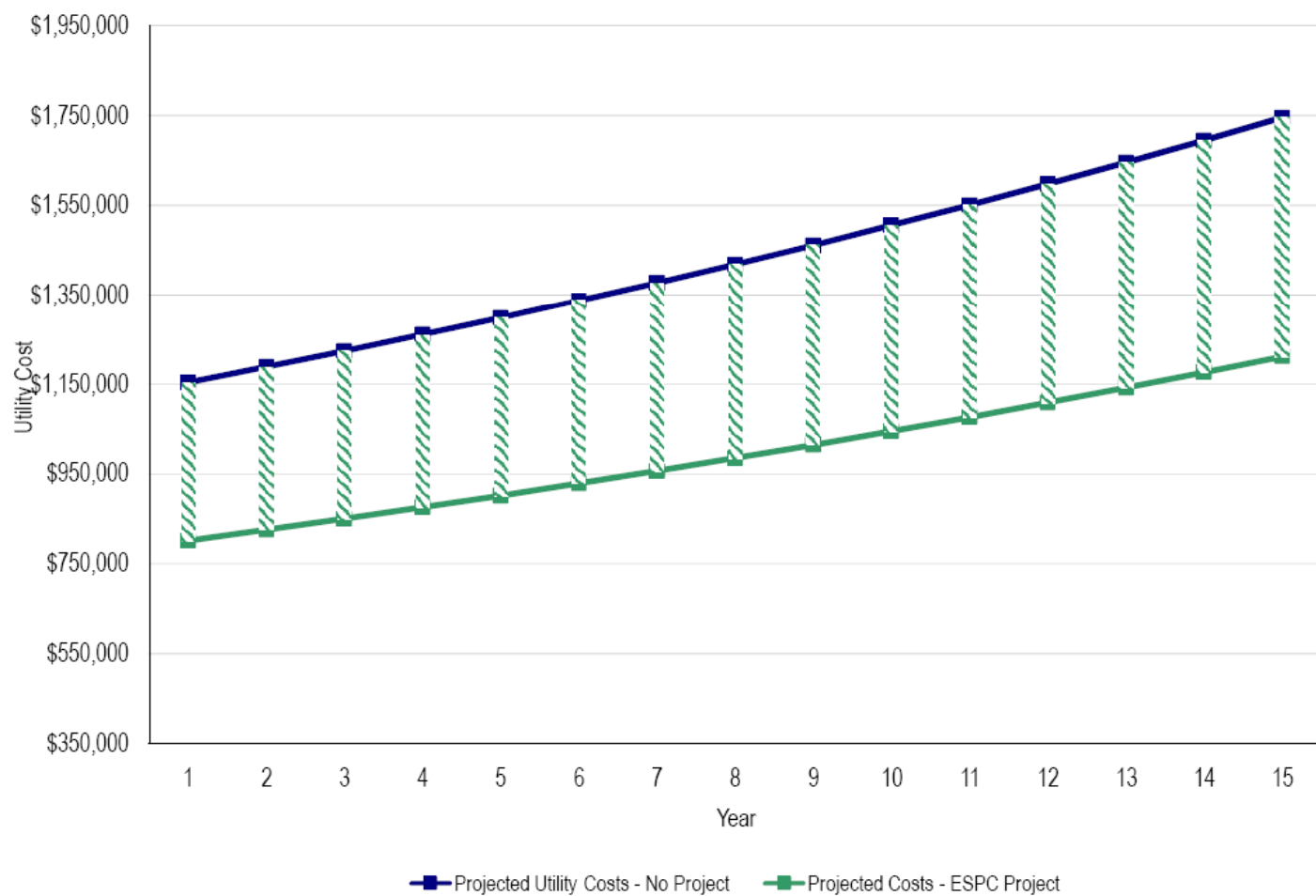


# Savings and Program Potential

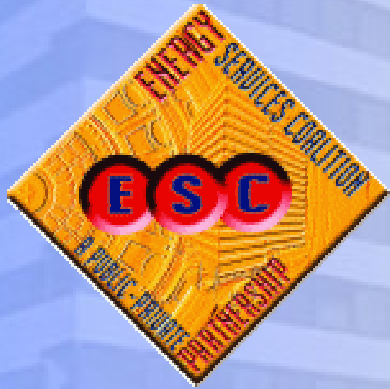
Potential Self-Funding Savings & Program Potential			
ECM Savings %:	26%	31%	36%
1st Year Energy Cost Savings:	\$215,962	\$258,159	\$300,356
1st Year Estimated O&M Savings:	\$79,384	\$94,895	\$110,406
1st Year Total Annual Cost Savings:	\$295,346	\$353,054	\$410,762
Measurement & Verification Fee:	\$17,936	\$21,440	\$24,944
Financed Interest Rate:	4.00%	4.00%	4.00%
12 Year Program Potential:	\$3,036,917	\$3,630,310	\$4,223,702
15 Year Program Potential	\$3,742,705	\$4,474,003	\$5,205,302



# Savings & Program Potential







# Guarantee Basics

- **Written guarantee that energy and operational savings will meet or exceed the costs of the ECMs within the term of the contract.**
- **Annual Reconciliation per the agreed upon Measurement and Verification Plan (M&V)**
- **If the guaranteed savings are not met; the ESCO pays the shortfall.**
- **Not a “shared savings” approach. The Municipality retains the benefits of any excess savings.**



# Measurement & Verification Basics

## International Performance Measurement & Verification Protocol (IPMVP)

- Comparison of measured energy consumption both before and after the facility improvement
- Options range from measurements of key parameters to computer simulation
- IPMVP provides direction on how to adjust for changes in weather, occupancy, changes to facility operation, etc.
- More info may be found at [www.evo-world.org](http://www.evo-world.org)



# Financing Options

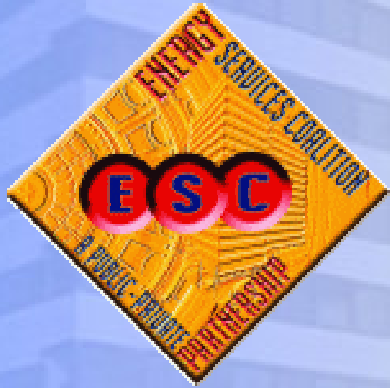
- **Statutes permit a local public agency to finance the installation of energy conservation measures through a lease-purchase agreement, bonds, or whatever brings the most economical value to the local public agency**
- **Finance agreement is typically executed between the Municipality/WWT-WT and a third party lender**
- **ESCO can assist with facilitating financing for the Municipality/WWT-WT**



# Financing Options

**Tax exempt financing remains near historic lows**

- **12 year fixed rates at approximately 3.75%**
- **15 year fixed rates at approximately 3.90%**



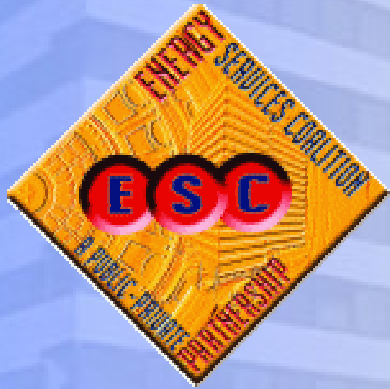
# How To Get Started

## **Five Steps to Successful Energy Performance Contracting**

- 1. Decide If ESPC is a Good Solution for You**
- 2. Select an Energy Services Company**
- 3. Contract with Your ESCO to Identify Energy Savings Opportunities**
- 4. Negotiate a Long Term Contract with Your ESCO**
- 5. Verify Savings and Enjoy the Benefits**

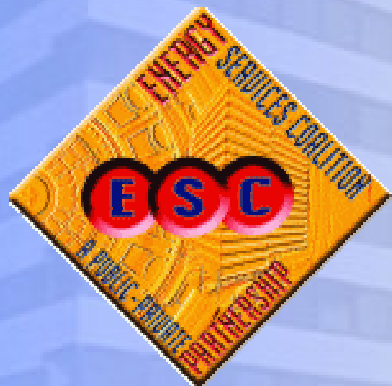
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## **Kentucky ESC Members from the Private Sector are Individuals Who Work for the Following Companies**

- **AMERESCO, Inc.**
- **Earthwell Energy Management, Inc.**
- **Energy Systems Group**
- **Honeywell Inc.**
- **Johnson Controls Inc.**
- **NORESCO**
- **Pepco Energy Services**
- **Siemens Industry, Inc.**
- **Trane Company**



# Energy Savings Performance Contracting

## Water and Wastewater Treatment Plant Energy Efficiency Workshop

### Questions and Answers

<http://energy.ky.gov/efficiency/Pages/Water-and-Wastewater.aspx>